

DRAFT-FOR DISCUSSION ONLY
DO NOT ENTER
AMENDMENTS TO THE CLAIMS

1. (Original) An etching apparatus, comprising:

an etching chamber for receiving a sample to be etched;

a source of etching gas; and

a collapsible, variable volume expansion chamber, said expansion chamber being in selective fluid communication with said source of etching gas and said etching chamber.

2. (Original) An etching apparatus according to claim 1, wherein said etching gas comprises xenon difluoride and said source of etching gas comprises a vacuum tight container holding xenon difluoride crystals.

3. (Original) An etching apparatus according to claim 1, further comprising a source of mixing gas in selective fluid communication with said expansion chamber.

4. (Original) An etching apparatus according to claim 3, wherein said mixing gas comprises nitrogen.

5. (Original) An etching apparatus according to claim 1, further comprising a vacuum pump in selective fluid communication with said expansion chamber and said etching chamber.

6. (Original) An etching apparatus according to claim 1, further comprising a heating and control apparatus for controlling a temperature of said etching chamber and a temperature of said expansion chamber.

**DRAFT-FOR DISCUSSION ONLY
DO NOT ENTER**

7. (Original) An etching apparatus according to claim 1, wherein said expansion chamber comprises a bellows.
8. (Original) An etching apparatus according to claim 7, wherein said bellows comprise stainless steel edge welded bellows.
9. (Original) An etching apparatus according to claim 1, wherein said expansion chamber comprises a fixed volume chamber having an interior moveable piston.
10. (Original) An etching apparatus according to claim 1, further comprising a sample load lock coupled to said etching chamber.
11. (Original) An etching apparatus according to claim 1, wherein a maximum volume of said expansion chamber is greater than a volume of said etching chamber.
12. (Original) An etching apparatus according to claim 1, further comprising a residual gas analysis apparatus coupled to said etching chamber.
13. (Original) An etching apparatus according to claim 1, further comprising means for analyzing gasses drawn from said etching chamber.
14. (Withdrawn)

**DRAFT-FOR DISCUSSION ONLY
DO NOT ENTER**

15. (Withdrawn)

16. (Withdrawn)

17. (Withdrawn)

18. (Withdrawn)

19. (Withdrawn)

20. (Withdrawn)

21. (Withdrawn)

22. (Withdrawn)

23. (Withdrawn)

24. (Withdrawn)

25. (Currently Amended) An etching apparatus, comprising:

an etching chamber for receiving a sample to be etched, said etching

chamber being in selective fluid communication with a vacuum pumping source;

a source of etching gas;

a first expansion chamber in selective fluid communication with said source of etching gas and said etching chamber, said first expansion chamber having a first direct fluid connection to a vacuum pumping source; and

a second expansion chamber in selective fluid communication with said source of etching gas and said etching chamber, said second expansion chamber having a second direct fluid connection to a vacuum pumping source;

wherein said first expansion chamber may be evacuated either through said first direct fluid connection or through said etching chamber, and wherein said second

DRAFT-FOR DISCUSSION ONLY
DO NOT ENTER

expansion chamber may be evacuated either through said second direct fluid connection or
through said etching chamber.

26. (Original) An etching apparatus according to claim 25, wherein said etching gas comprises xenon difluoride and said source of etching gas comprises a vacuum tight container holding xenon difluoride crystals.

27. (Original) An etching apparatus according to claim 25, further comprising a source of mixing gas in selective fluid communication with said first expansion chamber and said second expansion chamber.

28. (Original) An etching apparatus according to claim 27, wherein said mixing gas comprises nitrogen.

29. (Original) An etching apparatus according to claim 25, further comprising a second source of etching gas in selective fluid communication with said first expansion chamber and said second expansion chamber.

30. (Canceled)

31. (Original) An etching apparatus according to claim 25, further comprising an automatic heating and control apparatus for controlling a temperature of said etching chamber, a

DRAFT-FOR DISCUSSION ONLY
DO NOT ENTER

temperature of said first expansion chamber, and a temperature of said second expansion chamber.

32. (Original) An etching apparatus according to claim 25, further comprising a sample load lock coupled to said etching chamber.

33. (Original) An etching apparatus according to claim 25, further comprising a residual gas analysis apparatus coupled to said etching chamber.

34. (Original) An etching apparatus according to claim 25, further comprising means for analyzing gasses drawn from said etching chamber.

35. (Original) An etching apparatus according to claim 25, wherein said first and second expansion chambers have a fixed volume.

36. (Withdrawn)

37. (Withdrawn)

38. (Withdrawn)

39. (Original) An etching apparatus according to claim 27, wherein one of said first and second expansion chambers comprise a variable volume expansion chamber.

DRAFT-FOR DISCUSSION ONLY
DO NOT ENTER

40. (Original) An etching apparatus according to claim 27, wherein said first and second expansion chambers each comprise a variable volume expansion chamber.

41. (Original) An etching apparatus according to claim 27, wherein said source of etching gas is in selective fluid communication with said etching chamber.

42. (Original) An etching apparatus according to claim 41, further comprising a flow controller connected between said source of etching gas and said etching chamber and a vacuum pump in selective fluid communication with said etching chamber.

43. (Original) An etching apparatus according to claim 42, further comprising a source of mixing gas in selective fluid communication with said etching chamber and a second flow controller connected between said source of mixing gas and said etching chamber.

44. (Original) An etching apparatus according to claim 42, further comprising means for controlling the conductance of said vacuum pump.

45. (Withdrawn)

46. (Withdrawn)

47. (Withdrawn)

48. (Withdrawn)

49. (Withdrawn)

50. (Withdrawn)

**DRAFT-FOR DISCUSSION ONLY
DO NOT ENTER**

- 51. (Withdrawn)
- 52. (Withdrawn)
- 53. (Withdrawn)
- 54. (Withdrawn)
- 55. (Withdrawn)
- 56. (Withdrawn)
- 57. (Withdrawn)
- 58. (Withdrawn)
- 59. (Withdrawn)
- 60. (Withdrawn)
- 61. (Withdrawn)
- 62. (Withdrawn)
- 63. (Withdrawn)
- 64. (Withdrawn)
- 65. (Withdrawn)
- 66. (Withdrawn)
- 67. (Withdrawn)
- 68. (Withdrawn)
- 69. (Withdrawn)
- 70. (Withdrawn)
- 71. (Withdrawn)